

Remarks

Applicant respectfully requests favorable reconsideration of this office action response and amendment, as well as consideration of the pending claims as amended herein. The Examiner is encouraged to contact the undersigned by telephone to facilitate any remaining questions or issues.

Status of Pending Claims:

Claims 216-220, 222-229, 231-232, 235, 237-253, 258-260, 342 and 350 are pending in this application.

Claims 216, 218, 244 and 250 are (Currently amended).

Claims 219, 222-224, 227-229, 231-232, 235, 237-244, 247-250, 252-253, 258-260, 342 and 350 are (Previously presented).

Claims 217, 220, 225-226, 238, 245-246 and 251 are (Original).

There are no claims which are (New).

Claims 1-215, 221, 230, 233-234, 236, 254-257 are (Canceled).

Claims 261-341 and 343-349 are (Withdrawn).

Amendments to the Claims:

Amendments to claim 216 are supported in the instant specification on page 2 lines 22-29, page 21 line 11 – page 22 line 2, page 31 line 10 – page 32 line 1, page 43 line 26 – page 44 line 1; as well as in figures 2A, 3, 6-8, 10, 11, 14, 15-18, and 21A.

The amendment to claim 218 is non-substantive providing proper antecedent basis to the claim.

The amendments to claim 244 are non-substantive. The first provides proper antecedent basis to the claim; the second is a grammatical correction.

The amendments to claim 350 are non-substantive. The first provides proper antecedent basis to the claim; the second is a grammatical correction.

Summary of Examiner's Claim Rejections:

Claims 216-220, 222, 224, 231, 235, 238-240, 243, 248-253, 258, 342, are rejected under 35 U.S.C. 103(a) as being unpatentable over US 4841731 (Tindell) in view of U.S. 7062912 (Penfornis et al.). Claim 223 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 4841731 (Tindell) in view of U.S. 7062912 (Penfornis et al.) and U.S. 6588212 (Wallace et al.). Claims 225-227 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. 4841731 (Tindell) in view

of U.S. 7062912 (Penfornis et al.) and U.S. 5899072 (Gode). Claims 231, 235 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. 4841731 (Tindell) in view of U.S. 7062912 (Penfornis et al.) and U.S. 5516359 (Kang et al). Claim 237 is rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. 4841731 (Tindell) in view of U.S. 7062912 (Penfornis et al.) and U.S. 4440545 (Weidig). Claim 241 is rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. 4841731 (Tindell) in view of U.S. 7062912 (Penfornis et al.) and U.S. 3975913 (Erickson). Claim 242 is rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. 4841731 (Tindell) in view of U.S. 7062912 (Penfornis et al.) and U.S. 4664857 (Nambu). Claims 259-260, 350 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. 4841731 (Tindell) in view of U.S. 7062912 (Penfornis et al.) and U.S. 6212876 (Gregory et al.). Claims 244-247 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. 4841731 (Tindell) in view of U.S. 7062912 (Penfornis et al.) and U.S. 6698183 (Thordarson).

Marked-up Set of Claims (According to 37 CFR 1.121(c))

Claims 1 – 215 (Canceled)

216. (Currently amended) An engine comprising a combustion chamber, wherein a mixture of oxygen, as O₂, and hydrogen, as H₂, is combusted, wherein at least a portion of said oxygen is obtained by the separation of air, wherein ~~said the~~ separation of air is selected from the group consisting of:

(a) cryogenic air-separation,

(b) membrane separation, and

(c) pressure swing adsorption air separation, and _____

any combination thereof, wherein _____

at least a portion of the energy of combustion creates at least one of:

mechanical rotating energy, and

steam in the combustion chamber, wherein

at least one of the mechanical rotating energy and the steam powers at least a portion of said air separation, and wherein

the temperature of combustion is at least partially controlled with the addition of water to said combustion chamber in a way that maintains combustion or combustion exhaust temperature.

217. (Canceled)

218. (Currently amended) The engine of claim 21[[7]]6, wherein said rotating mechanical energy turns a generator to create electrical energy.

219. (Previously Presented) The engine of claim 216, wherein the steam produced by combustion turns a steam turbine, and wherein

said steam turbine turns a generator to create electrical energy.

220. (Original) The engine of claim 216, wherein heat is created.

221. (Canceled)

222. (Previously presented) The engine of claim 218 or 219, wherein at least a portion of said electrical energy is used in the electrolysis of water to hydrogen and oxygen, and wherein at least a portion of at least one of said hydrogen and oxygen is used in said mixture.

223. (Previously presented) The engine of claim 216, further comprising nitrogen or argon in said mixture.

224. (Previously presented) The engine of claim 216, wherein said oxygen further comprises air.

225. (Original) The engine of claim 216, wherein at least a portion of the steam produced by combustion is converted to hydrogen by the corrosion of at least one metal.

226. (Original) The engine of claim 225, wherein the conversion of said steam into said hydrogen is increased by an electrical current in said metal(s).

227. (Previously presented) The engine of claim 225 or 226, wherein said hydrogen is at least partially used in said mixture.

228. (Previously presented) The engine of claim 216, wherein a generator turns due to the movement of air or water, and wherein
said generator creates electrical energy, and wherein
said electrical energy is at least partially utilized in the electrolysis of water to hydrogen and oxygen, and wherein
at least a portion of at least one of said hydrogen and oxygen is used in said mixture.

229. (Previously presented) The engine of claim 216, wherein a photovoltaic cell creates electrical energy, wherein
said electrical energy is at least partially used in the electrolysis of water to hydrogen and oxygen, and wherein
at least a portion of at least one of said hydrogen and oxygen is used in said mixture.

230. (Canceled)

231. (Previously presented) The engine of claim 216, wherein at least a portion of the nitrogen separated from air in said cryogenic air separation unit is used to cool any portion of at least one selected from a list consisting of: said cryogenic air separation unit, the storage of oxygen, the storage of hydrogen, electrolysis, coolant for said engine, said engine and any combination thereof.

232. (Previously presented) The engine of claim 231, wherein said nitrogen separated from air in said cryogenic air separation unit is at least partially used to cool air or water.

223 – 234. (Canceled)

235. (Previously presented) The engine of claim 216, wherein said oxygen separated from air is at least one of enriched oxygen, pure oxygen and very pure oxygen.

236. (Canceled)

237. (Previously Presented) The engine of claim 216, wherein at least one selected from a list consisting of a: corrosion inhibitor, chelant, dispersant and any combination therein is added to at least a portion of the water in said engine.

238. (Original) The engine of claim 216, wherein said engine performs at least one of: internal, turbine and heating combustion.

239. (Previously Presented) The engine of claim 216, wherein at least one of oxygen and hydrogen is stored in at least one of a cooled gas state and a liquid state by liquefaction.

240. (Previously Presented) The engine of claim 239, wherein compressor(s) for at least one of cooling and liquefaction is powered by at least one of said engine and a fuel cell.

241. (Previously Presented) The engine of claim 240, wherein said fuel cell is powered by hydrogen and at least one of oxygen and air.

242. (Previously Presented) The engine of claim 216, wherein at least one of said hydrogen and oxygen is stored in a mixture with frozen water crystals to form a gel.

243. (Previously presented) The engine of claim 216, wherein at least one selected from a list consisting of: hydrogen, oxygen and water is preheated prior to combustion with the energy from at least one selected from a list consisting of: ambient temperature, said engine, said engine exhaust, an electrical radiant heat source and any combination therein.

244. (Currently amended) The engine of claim 21[[7]]6, wherein said mechanical rotating energy ~~from said engine~~ enters a transmission, wherein

 said transmission engage in a manner that is inversely proportional to at least one of the torque and work output of said engine, and wherein

 said transmission output mechanical rotating energy turns a generator to create electrical energy.

245. (Original) The engine of claim 244, wherein said transmission engage a flywheel capable of storing rotational kinetic energy, wherein

 said flywheel turns said generator.

246. (Original) The engine of claim 244, wherein at least a portion of said electrical energy is used in the electrolysis of water to hydrogen and oxygen.

247. (Previously presented) The engine of claim 246, wherein at least a portion of at least one of said hydrogen and oxygen is used in said mixture.

248. (Previously Presented) The engine of claim 216 or 219, wherein a pressure control device is in said engine exhaust.

249. (Previously Presented) The engine of claim 216, wherein at least one of said engine combustion heat energy and said engine exhaust energy is used to heat at least one of a gas and a liquid.

250. (Previously Presented) The engine of claim 249, wherein at least one of the gas is air and the liquid is water.

251. (Original) The engine of claim 250, wherein said exhaust discharge directly into said air or water.

252. (Previously presented) The engine of claim 216, wherein at least a portion of said engine is insulated.

253. (Previously presented) The engine of claim 216, wherein hydrogen is separated from at least one selected from a list consisting of: water, air, nitrogen, oxygen and any combination thereof within said air separation unit.

254 - 257. (Canceled)

258. (Previously presented) The engine of claim 216, wherein the temperature of said engine exhaust is at least partially cooled with the addition of water to said engine exhaust.

259. (Previously presented) The engine of claim 258, comprising jet propulsion.

260. (Previously presented) The engine of claim 216 or 258, comprising rocket propulsion.

Claims 261 - 341 (Withdrawn)

342. (Previously presented) The engine of claim 216, wherein said engine comprises a turbine.

Claims 343 - 349 (Withdrawn)

350. (Currently amended) The engine of claim 2[[5]]16, comprising jet propulsion wherein said air is stoichiometrically increased in the jet intake for hydrogen thermodynamics and/or to operate with excess air for cooling.

Examiner Arguments

Examiner Argument

Applicant argued the Examiner cites the MPEP section 716.02(e) is about the claimed range. The Examiner disagrees because the claimed range section does not belong to MPEP section 716.02(e) but to the preceding section 716.02(d). Nevertheless, all sections are under MPEP 716 can be used to treat the affidavit under 37 CFR 1.132. Again, the Examiner would like to repeat the following paragraph from the previous Office Action. Applicant argued the declaration under rule 312 is directed to the claimed invention, not the invention. The Examiner strongly disagrees. First, Applicant simply provides his own argument, this is improper, but he must provide argument, Applicant's argument cannot replace evidence in affidavit 312, note MPEP 716.01(c). Second, the declarations fail to compare the claimed subject matter with the closest prior art as required in MPEP 716.02(e), it's unclear how Applicant can jump to a conclusion that his declaration could overcome the pending rejections without providing any comparison with the prior art, or any opinion about the rejection in the declaration. Third and most importantly, even assuming arguendo that the declaration meet all the requirements that provide evidences, comparison with prior art, opinions about the pending rejections, the Examiner still needs to use his judgment of a person having ordinary skill in the art to make his decision.

Applicant's Response

Applicant appreciates time of the Examiner to formulate his argument.

Applicant respectfully presents to the Examiner that Applicant has contacted declarant Walker, obtaining from declarant Walker an updated declaration which: 1) directly presents 312 evidence and is directly quoted herein, 2) the instant claims are compared to the art cited by the Examiner, and 3) states declarant Walker to be one of ordinary skill in the art of combustion and of combustion science.

Examiner Argument

Applicant is also noted in the MPEP 716.04, there is a statement that "Although the claimed invention achieved the to do so". It's very clear that the claimed invention must be considered, not the whole specification. Applicant can't file a declaration under 1.132 for the whole invention, then recite broad claims and expected the case to be allowed.

Applicant's Response

Applicant appreciates time of the Examiner to formulate his statement.

Applicant has respectfully asked declarant Walker to review the instant pending claims and compare the pending claims to the prior art of record.

Examiner Argument

Applicant argued Penfornis does not disclose the combustion of a hydrogen fuel and it would not have been obvious to combine the references. The Examiner disagrees because Applicant attempts to attack the references individually in a 103 rejection which is improper. Tindell already teaches the concept of burning hydrogen. Penfornis does not need to show that concept again.

Applicant's Response

Applicant appreciates time of the Examiner to formulate his argument.

Applicant would like to respectfully present to the Examiner that there is no limitation within instant independent claim 216 or teaching within the instant specification for: a flue gas, a heat exchanger or the use of steam generated by a flue gas to produce power, wherein said power drives an air separation unit, as is taught by Penfornis et al. In contrast to Penfornis et al., instant independent claim 216, as amended, now reads:

216. An engine comprising a combustion chamber, wherein a-mixture of oxygen, as O₂, and hydrogen, as H₂, is combusted, wherein
at least a portion of said oxygen is obtained by the separation of air, wherein the separation of air is selected from the group consisting of:
(a) cryogenic separation,
(b) membrane separation,

(c) pressure swing adsorption, and
any combination thereof, wherein
at least a portion of the energy of combustion creates at least one of:
mechanical rotating energy, and
steam in the combustion chamber, wherein
at least one of the mechanical rotating energy and the steam powers at
least a portion of said air separation, and wherein

the temperature of combustion is at least partially controlled with the
addition of water to said combustion chamber in a way that maintains combustion or
combustion exhaust temperature.

While Penfornis et al., nor Tindel et al. in combination with Penfornis et al., teach all of the limitations within instant independent claim 216, as amended herein, Applicant would like to respectfully present to the Examiner that the requirements and/or limitations within Penfornis et al. would lead one of ordinary skill in the art away from the instant invention and the instant independent claim, e.g. said requirements and/or limitations teach away from the instant independent claim. Penfornis et al. require the production of a flue gas, which teaches hydrocarbon combustion, in combination with a heat exchanger within all teachings.

In strong contrast to Penfornis et al., the instant invention teaches and the instant independent claim comprises creation of steam from the combustion chamber to power air separation, which is not taught or suggested in Penfornis et al. In strong contrast to Penfornis et al., the instant invention teaches and the instant claim comprises creation of rotating mechanical energy to power air separation, which is not taught or suggested in Penfornis et al. Applicant refers the Examiner within the instant invention to Figures 2A, 3, 6-8, 10-11, 15-18, 21 and 21A. Applicant also refers the Examiner within the instant specification to paragraphs 34, 79, 80, 83-85, 87-89, 92-95, 98 and 119-120. This difference is an important aspect for the inventive step in the instant invention; and therefore, renders the instant invention non-obvious as compared to the prior art and the cited reference.

Examiner Argument

Applicant argued there is no motivation to combine the references. The Examiner disagrees. It's very clear in the rejection that using the air separation unit in

Tindell can have the advantage "for the purpose of more effectively forming oxygen for the combustion process, and to reserve power input because of the power feedback".

Applicant's Response

Applicant appreciates time of the Examiner to formulate his argument.

However, the Examiner has previously stated that Tindel et al. does not teach or suggest the separation of air to obtain oxygen for combustion. To be sure of this fact, Applicant performed a word search in the electronic version of Tindel et al. The word "air" does not appear in Tindel et al. The word "separation" does not appear in Tindel et al. In contrast to instant independent claim 216, Tindel et al. teach the electrolysis of water to obtain hydrogen and oxygen for combustion. Specifically, in the abstract of Tindel et al. is stated:

[57]

ABSTRACT

A solar-powered system for supplying large quantities of usable power consists of an array of photo-voltaic cells which drive an electrolysis generator in which water is converted into oxygen and hydrogen gases. The oxygen and hydrogen gases are initially stored and then mixed in stoichiometric amounts and delivered by means of a water-cooled discharge nozzle to a burner chamber in which the gases are recombined. High pressure steam produced by the oxygen/hydrogen recombination is discharged from the burner to a turbine generator. Condensed water is collected from the turbine and used as distilled water for domestic uses or returned to the electrolysis generator.

This is while, per Applicant's Previous Respectful Argument, there is no teaching or suggestion in Penfornis et al. to use either use steam or mechanical rotating energy to power air separation.

Examiner Argument

Applicant argued Penfornis needs a heat exchanger and his invention does not need that. Please note if the references teach more than the claimed invention, then the rejection is still valid. The rejection is not valid only if the reference does not teach the claimed invention.

Applicant's Response

Applicant appreciates time of the Examiner to formulate his argument and to provide comment for Applicant.

Applicant respectfully presents to the Examiner as stated above, the presently amended independent claim 216 comprises claim limitations not taught or suggested by Penornis et al. or Tindel et al.

Examiner Argument

Applicant argued it's impermissible hindsight to combine the references. The Examiner disagrees. The modified feature is simply using air separation unit which is well known and taught in the secondary reference, Penornis, and the rejections have been made with proper motivation, that is not hindsight reconstruction.

Applicant's Response

Applicant appreciates time of the Examiner to formulate his argument and to provide comment for Applicant.

Applicant respectfully refers the Examiner to the presently amended independent claim 216, which comprises limitations not taught by Penornis et al. or Tindel et al.

Examiner Argument

Regarding claim 242, Applicant argued Nambu requires a hydrocarbon alcohol. Please note that claim 242 simply recites either hydrogen or oxygen being mixed with frozen water to form gel. Nambu clearly teaches the hydrogel in frozen water under freezing temperature. It does not matter if Nambu needs to use hydrocarbon alcohol because as set forth above, if the reference teaches more than the claimed invention, the rejection is still valid.

Applicant's Response

Applicant appreciates time of the Examiner to formulate his argument and to provide comment for Applicant.

Applicant respectfully presents to the Examiner that Nambu does not present, teach or suggest a frozen gel comprising hydrogen, as H₂, which is claimed in the instant claim. Neither is there any suggestion or motivation within any other cited reference to store hydrogen or oxygen in any frozen state or in combination with another frozen element or compound; therefore, all of the claim limitations within instant dependent claim 242 have not been taught by the citations. In contrast to instant claim 242 and to the teachings within the instant invention, Nambu teaches the formation of a "hydrogel" comprising polyvinyl alcohol and water with no mention of hydrogen. Specifically, Nambu states in the abstract:

[57] **ABSTRACT**

A hydrogel which has a water content of 20 to 92 weight % and which is stable and superior in mechanical properties is obtained by preparing a 3 to 25 weight % aqueous solution of a polyvinyl alcohol having a degree of hydrolysis not less than 95 mol % and a viscosity-average polymerization degree of not less than 1,500, then pouring the aqueous polyvinyl alcohol solution into a desired shape of a vessel or a mold, then freeze-molding the aqueous polyvinyl alcohol solution at a temperature lower than -6° C., thereafter dehydrating the molded article without thawing it until the dehydration percentage reaches 5 weight % or more and, if required, immersing the dehydrated product in water.

Therefore, Nambu has no teaching or suggestion in relation to hydrogen, as H₂. This is while Applicant can find no teaching within any other cited reference to store either hydrogen or oxygen with any other frozen element or compound.

Examiner Argument

Regarding other 103 rejections for dependent claims, Applicant did not really provide separate arguments. Also, most arguments have been well addressed in the previous Office Action. It's clear that those dependent claims should stand and fall with the independent claims.

Applicant's Response

Applicant appreciates time of the Examiner to formulate his argument and to provide comment for Applicant.

Applicant herein respectfully repeats his argument from the last office action response for dependent claims 225-227, 231, 235, 237, 241, 259-260, 350, and 244-247.

Examiner's Rejections and Objections Along with Applicant's Responsive Argument**The Examiner rejects**

Claims 216-220, 222, 224, 231, 235, 238-240, 243, 248-253, 258, 342, are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. 4841731 (Tindell) in view of U.S. 7062912 (Penfornis et al).

Applicant's Response

Applicant appreciates the Examiner's work in preparing the above prime face case.

While Applicant has provided argument previous in this office action response which is responsive to the Examiner's Rejection, Applicant would like to respectfully add that:

1. The instant invention answers a Long Felt and Unresolved Need to Humanity as is evidenced in the declaration of Mr. Colin Walker and quoted from the declaration of Mr. Colin Walker in this office action response, ref. MPEP 716.04, KSR International v. Teleflex, Inc. et al., No. 04-1350, 550 U.S. _(2007), and MPEP 716.01(a).
2. While Tindel et al. do not teach the separation of air, Penfornis et al. do not teach the separation of air as claimed in instant independent claim 216, ref. MPEP 2143.03.
3. Applicant would like to respectfully present to the Examiner that the combination of Tindel et al. and Penfornis et al. does not teach all of the claim limitations within amended independent claim 216; therefore, in order to arrive at instant independent claim 216 from the combination of Tindel et al. and Penfornis et al. one would have to perform hindsight reconstruction, ref. MPEP 2145 X.
4. As Penfornis et al. teach the use of flue gas, Penfornis et al. teach away and leads away from instant independent claim 216, ref. MPEP 2145D and 2141.02 VI, respectfully.
5. The inventive step performed by Applicant is the management of energy in the combustion of hydrogen and oxygen in combination with the attainment of pure oxygen to limit NO_x formation, as taught in the instant specification and as claimed

in instant independent claim 216. None of the cited references teach or suggest Applicant's teachings which are incorporated into instant independent claim 216 and which are discussed herein previous, ref. MPEP 2141.02.

Further, it is important for Applicant to emphasize to the Examiner that in reference to combustion chemistries and operating equipment, as well as a combustion engine that does not produce CO_x or NO_x, Applicant has identified the **source of the problem** not previously identified within any of the Examiner's Citations. Specifically, Applicant teaches novel applications of the combustion of hydrogen and oxygen, therein providing unique improvements within the instant invention not previously taught, suggested or motivated, especially within the Examiner's citations. Applicant refers the Examiner within the instant specification to paragraphs 12, 13 and 14, along with those previously presented above, e.g. Figures 2A, 3, 6-8, 10-11, 15-18, 21 and 21A, and paragraphs 34, 79, 80, 83-85, 87-89, 92-95, 98 and 119-120. In combination with these references within the instant invention, Applicant refers the Examiner to MPEP 2141.02.

Applicant has respectfully traversed the Examiner's Rejection and herein respectfully requests an allowance of claims 216-220, 222, 224, 231, 235, 238-240, 243, 248-253, 258 and 342.

The Examiner rejects

Claim 223 is rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. 4841731 (Tindell) in view of Penfornis et al and U.S. 6588212 (Wallace et al).

Applicant's Response

Applicant would like to respectfully present to the Examiner that once Applicant has traversed a prime facie case of obviousness relating to an independent claim, in this case claim 216, Applicant has also traversed the rejection of any claim which depends upon the independent claim, reference MPEP 2143.03. Therefore, as Applicant has respectfully traversed the Examiner's 35 U.S.C. 103(a) rejection of independent claim 216, Applicant respectfully requests an allowance of claim 223.

The Examiner rejects

Claims 225-227 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. 4841731 (Tindell) in view of Penfornis et al and U.S. 5899072 (Gode).

Applicant's Response

Applicant would like to respectfully present to the Examiner that once Applicant has traversed a

prime facie case of obviousness relating to an independent claim, in this case claim 216, Applicant has also traversed the rejection of any claim which depends upon the independent claim, reference MPEP 2143.03. Therefore, as Applicant has respectfully traversed the Examiner's 35 U.S.C. 103(a) rejection of independent claim 216, Applicant respectfully requests an allowance of claims 225-227.

The Examiner rejects

Claims 231, 235 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. 4841731 (Tindell) in view of Penfornis et al and U.S. 5516359 (Kang et al).

Applicant's Response

Applicant would like to respectfully present to the Examiner that once Applicant has traversed a prime facie case of obviousness relating to an independent claim, in this case claim 216, Applicant has also traversed the rejection of any claim which depends upon the independent claim, reference MPEP 2143.03. Therefore, as Applicant has respectfully traversed the Examiner's 35 U.S.C. 103(a) rejection of independent claim 216, Applicant respectfully requests an allowance of claims 231 and 235.

The Examiner rejects

Claim 237 is rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. 4841731 (Tindell) in view of Penfornis et al and U.S. 4440545 (Weidig).

Applicant's Response

Applicant would like to respectfully present to the Examiner that once Applicant has traversed a prime facie case of obviousness relating to an independent claim, in this case claim 216, Applicant has also traversed the rejection of any claim which depends upon the independent claim, reference MPEP 2143.03. Therefore, as Applicant has respectfully traversed the Examiner's 35 U.S.C. 103(a) rejection of independent claim 216, Applicant respectfully requests an allowance of claim 237.

The Examiner rejects

Claim 241 is rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. 4841731 (Tindell) in view of Penfornis et al and U.S. 3975913 (Erickson).

Applicant's Response

Applicant would like to respectfully present to the Examiner that once Applicant has traversed a prime facie case of obviousness relating to an independent claim, in this case claim 216,

Applicant has also traversed the rejection of any claim which depends upon the independent claim, reference MPEP 2143.03. Therefore, as Applicant has respectfully traversed the Examiner's 35 U.S.C. 103(a) rejection of independent claim 216, Applicant respectfully requests an allowance of claim 241.

The Examiner rejects

Claim 242 is rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. 4841731 (Tindell) in view of Performis et al and US 4664857 (Nambu).

Applicant's Response

Applicant would like to respectfully present to the Examiner that the Nambu reference does not teach the formation of a hydrogen or an oxygen gel, as claimed. Applicant refers the Examiner to previous argument of Applicant presented herein. As Applicant has respectfully traversed the Examiner's rejection of 242, Applicant respectfully requests an allowance of claim 242.

The Examiner rejects

Claims 259-260, 350, are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. 4841731 (Tindell) in view of Performis et al and US 6212876 (Gregory et al).

Applicant's Response

Applicant would like to respectfully present to the Examiner that once Applicant has traversed a prime facie case of obviousness relating to an independent claim, in this case claim 216, Applicant has also traversed the rejection of any claim which depends upon the independent claim, reference MPEP 2143.03. Therefore, as Applicant has respectfully traversed the Examiner's 35 U.S.C. 103(a) rejection of independent claim 216, Applicant respectfully requests an allowance of claims 259-260 and 350.

The Examiner rejects

Claims 244-247 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. 4841731 (Tindell) in view of Performis et al and U.S. 6698183 (Thordarson).

Applicant's Response

Applicant would like to respectfully present to the Examiner that once Applicant has traversed a prime facie case of obviousness relating to an independent claim, in this case claim 216, Applicant has

also traversed the rejection of any claim which depends upon the independent claim, reference MPEP 2143.03. Therefore, as Applicant has respectfully traversed the Examiner's 35 U.S.C. 103(a) rejection of independent claim 216, Applicant respectfully requests an allowance of claims 244-247.

Declaration of Mr. Colin Walker

Revealing an understanding of disbelief on the part of the DOD as reviewed by Mr. Walker, Mr. Walker states in his declaration in paragraphs 5 and 6:

5. My belief in the non-obviousness of the claims and teachings within the styled patent application are exemplified in the interchange between the inventor and the U.S. Department of Defense, as evidenced herein in Exhibit A. I have reviewed the interchange, finding the skeptical and rather aggressive argument provided by Mr. Kessling and the U.S. DOD to leave the styled invention as non obvious to the U.S. DOD; this is why a combustion system as taught in the styled patent application should be of interest to an organization such as the U.S. DOD.
6. It is only reasonable to conclude that Mr. Kessling, the U.S. DOD and Mr. Kessling's colleagues are of at least ordinary skill in the art of combustion science.

Revealing that the instant patent application is the first Mr. Walker has seen of the teachings within the instant patent application, Mr. Walker states in his declaration in paragraphs 7 and 8:

7. Other than the teachings within the styled patent application, at this time there is no known method or apparatus to combust hydrogen with a pure form of oxygen without storage of oxygen. This is because oxygen is a combustible and dangerous material to store.
8. I would state that a method or apparatus to combust hydrogen with a pure form of oxygen, as taught in U.S. Patent Application 10/790,316 and claimed therein, is non-obvious to those of ordinary skill in the art of combustion science without the teachings of the styled patent application and answers said long felt need of humanity.

Revealing that Mr. Walker has read the pending claims and compared the pending claims to that of the prior art of record, Mr. Walker states in his declaration in paragraphs 9 and 15:

9. I have read the pending claims as of this date in the pending U.S. Patent Application 10/790,316; I understand those claims, as well as those claims in relation to the specification.
15. I have reviewed the pending claims as of this date within U.S. Patent Application 10/790,316 and compared the pending claims with the prior art cited by the Patent Examiner, specifically U.S. Pat. No. 4,841,731 (Tindel et al.); U.S. Pat. No. 7,062,912 (Penfornis et al.); U.S. Pat. No. 6,588,212 (Wallace et al.); and U.S. Pat. No. 4,664,857 (Nambu). I do not find this prior art cited by the Patent Examiner to have made the pending claims within U.S. Patent Application 10/790,316 as obvious. In fact, I find Penfornis et al. and Wallace et al. as improvements upon existing hydrocarbon processes; whereas, the Haase Application is a new and different process. In many instances, I find the art cited by the Patent Examiner to lead one away from the pending claims within U.S. Pat. Application 10/790,316.

Revealing Mr. Walker's opinion and belief regarding the instant invention and the pending claims to answer a long felt and unresolved need of humanity, Mr. Walker states in his declaration

in paragraphs 10 through 13:

10. As I have read and understand the invention claims of Mr. Haase within U.S. Patent Application 10/790,316, which propose a method and an apparatus to combust a pure form of hydrogen with a pure form of oxygen, wherein a portion of the combustion energy is used to separate air as a means to provide the pure form of oxygen to combustion. It is my opinion and belief that this teaching and the claims thereupon are non-obvious without the teachings of the styled patent application while answering a long felt industry need known by those of ordinary and of expert skill in the art, as well as a long felt need of humanity.
11. As I have read and understand the invention claims of Mr. Haase within U.S. Patent Application 10/790,316, which propose a method and an apparatus to combust a pure form of hydrogen with a pure form of oxygen, wherein a portion of the combustion energy is used to separate air to provide the pure form of oxygen to combustion. It is my understanding and belief that this teaching will increase the amount of hydrogen and of oxygen in the combustion chamber, thereby improving available torque per cubic inch of combustion chamber previous. It is my opinion that this teaching and the claims thereupon are non-obvious without the teachings of the styled patent application while answering a long felt industry need known by those of ordinary and of expert skill in the art, as well as a long felt need of humanity.
12. As I have read and understand the invention claims of Mr. Haase within U.S. Patent Application 10/790,316, which propose a method and an apparatus to combust a pure form of hydrogen with a pure form of oxygen, wherein a portion of the combustion energy is used to separate air to provide the pure form of oxygen to combustion while using the available cryogenic nitrogen as a means of reducing the temperature of stored hydrogen to a temperature below the joule Thompson curve of hydrogen, thereby improving the storage effectiveness of hydrogen. It is my opinion and belief that this teaching and the claims thereupon are non-obvious without the teachings of the styled patent application while answering a long felt industry need known by those of ordinary and of expert skill in the art, as well as a long felt need of humanity.
13. As I have read and understand the invention claims of Mr. Haase within U.S. Patent Application 10/790,316, which propose a method and an apparatus to combust a pure form of hydrogen with an excess amount of air so as to use the combustion envelop of hydrogen in combination with an amount of air in excess of that required to perform combustion as a means of cooling combustion and thereby reduce the formation of oxides of nitrogen. I also understand that the invention of Mr. Haase, 10/790,316, claims this teaching for jet engines, e.g. turbo-machinery. It is my opinion and belief that this teaching and the claims thereupon are non-obvious without the teachings of the styled patent application while answering a long felt industry need known by those of ordinary and of expert skill in the art, as well as a long felt need of humanity.

In relation to the instant invention and the pending claims being of significant need to the industry and known by those or both ordinary and expert skill in the art, Mr. Walker states in paragraph 14:

14. As combustion methods, engines and devices comprise a significant market and as there exist many marketed devices within the combustion, engine and turbo-machinery industries in combination with a world wide knowledge of the environmental consequences of hydrocarbon combustion methods, there should not previously nor today exist any lack of interest or lack of appreciation of an invention's potential or marketability to a method or apparatus as presented and claimed in the invention of Mr. Haase, U.S. Patent Application 10/348,071.

Applicant respectfully submits to the Patent Examiner that the declaration of Mr. Colin Walker satisfies MPEP 716.04, therein demonstrating that the instant claims answer a long felt and

unresolved need of humanity; this long felt and unresolved need of humanity is an indicia that the pending claims are non-obvious to those of ordinary skill in the art.

CONCLUSION

In view of the foregoing, Applicant believes that the claims as presently amended, are in order for allowance; Applicant respectfully requests favorable reconsideration of this response and amendment, and allowance of the claims at the earliest opportunity.

Applicant has respectfully presented to the Examiner that the cited combinations either: **do not teach all of the claim limitations, teach away from or perform hindsight reconstruction** in relation to the instant claims.

Applicant has also respectfully presented to the Examiner that the cited combinations do not present or teach **the source of the problem** as has Applicant.

Applicant has further respectfully presented a secondary consideration in the form of a declaration from a person of ordinary skill in the art which demonstrates that the instant invention and the instant invention claims **answer a long felt and unresolved need**, which has been recognized by those of ordinary skill in the art for some time and which was not answered prior to the filing of the instant invention.

Applicant has further still previously presented **disbelief to the instant invention**, as claimed, from a representative of the US DOD, wherein said representative is at least one of ordinary skill in the art while representing those who are obviously of expert skill in the art.

Applicant appreciates the time and effort afforded by the Examiner in the prosecution of the instant claims for the instant invention.

As Applicant has respectfully traversed all of the Examiner's rejections, Applicant herein requests the award certificate for the instant claims as amended and presented herein.

Respectfully submitted,



Richard A. Haase, Inventor & Applicant

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